

## WHAT IS CLAIMED IS:

## 1. A lamp comprising:

an illuminant section having an illuminant for  
5 irradiating a light, whose size being determined by an arc  
length and a direction of the arc length being equal to a  
direction of an optical axis of the lamp, and a center point of  
the illuminant being equal in position to one ellipsoidal focus  
of the lamp;

10 a lamp reflector for condensing a light flux emitted from  
the center point of the illuminant by its ellipsoidal of  
revolution about the optical axis into the other ellipsoidal  
focus on the optical axis; and

a lamp front glass having a plate-shaped incident plane  
15 and a plate-shaped outgoing plane, for receiving the light flux  
reflected by the lamp reflector through the incident plane and  
outputting the light flux through the outgoing plane,

wherein the ellipsoidal of revolution of the lamp  
reflector is formed by deforming with a aspherical reflection  
20 surface which is in symmetry of rotation to the optical axis,  
and at least one of the incident plane and the outgoing plane  
of the lamp front glass is so formed by deforming with a  
aspherical lens surface which is in symmetry of rotation to the  
optical axis, and

25 a different power for each radiation direction is applied  
to each light flux from the illuminant by the aspherical  
reflection surface and the aspherical lens surface apply in  
order to suppress a distribution of a divergent angle at the  
outgoing plane of the lamp front lens.

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2. The lamp according to claim 1, wherein the divergent

angle of the outgoing light flux at an optional point on the outgoing plane of the lamp front lens becomes constant.

3. A condensing optical system comprising:

5 the lamp according to claim 1;

an integrator optical system for receiving through its incident plane a light flux output from the lamp which is condensed on a condensing point of the aspherical lens surface of the lamp, and for reflecting the light flux by its side  
10 surface, and for outputting the light flux through its outgoing plane.

4. The condensing optical system according to claim 3,

wherein a shape of the integrator optical system is a  
15 square pole having incident plane and outgoing plane of a rectangle-shaped, and

the integrator optical system comprises:

an outgoing aperture having a rectangle-shaped area which is equal to the area of the incident plane of the  
20 integrator optical system, and the outgoing aperture is fixed to the incident plane of the integrated optical system;

an incident aperture of the duct-shaped mirror has an rectangle-shaped area which is larger than the area of the  
25 outgoing aperture, through which the light flux emitted from the lamp is input; and

four planar mirrors whose reflecting surfaces enclose the optical axis of the integrator optical system,

wherein at least a part of the incident light other than  
30 the incident light which is directly input into the incident plane of the planar mirrors is reflected by the reflecting

surface of the planar mirrors and output through the outgoing aperture.

5. An image display device comprising:

5 the condensing optical system according to claim 3;

a relay optical system for relaying lights output from the condensing optical system;

an optical modulation element for giving image information the lights output from the relay optical system,  
10 and for outputting the lights with the image information;

a projecting optical system for projecting the lights with the image information output from the optical modulation element; and

a screen for receiving the lights projected by the  
15 projecting optical system and for displaying the image based on the image information.

6. The image display device according to claim 5, wherein

the optical modulation element is made up of a plurality  
20 of small-sized mirrors and acts as a reflecting optical modulation means for outputting the lights with the image information to the projecting optical system.

7. The image display device according to claim 5, wherein

25 the optical modulation element is made up of a liquid crystal panel for controlling the lights with the image information by polarization or light scattering.